FALL 2020 SEMI-ANNUAL PROGRESS REPORT
SELECTION OF REMEDY AT CCR UNITS OF THE COLSTRIP STEAM ELECTRIC STATION
TALEN MONTANA, LLC

Per Requirements of 40 CFR §§ 257.97(a)

Prepared for:

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ACRONYMS AND ABBREVIATIONS

1&2 BAP	Colstrip 1&2 Bottom Ash Pond
1&2 B Pond	Colstrip 1&2 B Flyash Pond
3&4 BAP	Colstrip 3&4 Bottom Ash Pond
3&4 EHP	Units 3 & 4 Effluent Holding Pond
ACM	Assessment of Corrective Measures
AOC	Administrative Order on Consent
Appendix IV	Appendix IV to 40 CFR Part 257—Constituents for Assessment Monitoring
ASD	Alternative Source Demonstration
BAP	Bottom Ash Pond
CCR	Coal Combustion Residuals
CCR Rule	2015 EPA Coal Combustion Residuals Rule
CCR units	All active CCR landfills, surface impoundments, and lateral expansions
CFR	Code of Federal Regulations
Colstrip SES	Colstrip Steam Electric Station
FOR	Facility Operating Record
GWPS	Groundwater Protection Standard
IC	Institutional Controls
MDEQ	Montana Department of Environmental Quality
MNA	Monitored Natural Attenuation
PPLMT	PPL Montana, LLC
PRB	Permeable Reactive Barrier
RAA	Remedial Alternative Assembly
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial Design/Remedial Action
SSL	Statistically Significant Level
STEP	Units 1&2 Stage II Evaporation Pond
STEP E Cell	Colstrip 1&2 STEP E Cell
Old Clearwell	Colstrip 1&2 STEP Old Clearwell
Talen	Talen Montana, LLC
US EPA	U.S. Environmental Protection Agency

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1.0 INTRODUCTION

1.1 BACKGROUND

1.1.1 CCR Rule

On April 17, 2015, the United States Environmental Protection Agency (US EPA) published the final rule to regulate the disposal of Coal Combustion Residuals (CCR) as solid waste under subtitle D of the Resource Conservation and Recovery Act (RCRA). The "CCR Rule" sets minimum criteria for existing and new CCR landfills and existing and new CCR surface impoundments (US EPA 2015). All active CCR landfills, surface impoundments, and lateral expansions (CCR units) are subject to groundwater monitoring and corrective action under Code of Federal Regulations (CFR) Title 40 Parts 257.90 through 257.98, effective October 19, 2015.

1.1.2 Assessment of Corrective Measures §257.96

In accordance with §257.95(g)(3), within 90 days of finding that any of the constituents listed in Appendix IV (to Part 257) were detected at a statistically significant level (SSL) exceeding the groundwater protection standard (GWPS), the owner or operator must either (i) initiate an assessment of corrective measures (ACM), as required by §257.96; or (ii) demonstrate that a source other than the CCR unit caused the SSL. As operator, Talen MT, LLC (Talen) initiated an ACM for the following Colstrip Steam Electric Station (Colstrip SES) CCR units and Appendix IV constituents by January 15, 2019 to address the SSLs.

- Plant Site
    - Colstrip 1&2 B Flyash Pond (1&2 B Pond) – lithium and cobalt
    - Colstrip 1&2 Bottom Ash Pond (1&2 BAP) – lithium and cobalt
    - Colstrip 3&4 Bottom Ash Pond (3&4 BAP) – lithium, cobalt, and molybdenum

- Units 1&2 Stage Two Evaporation Pond (1&2 STEP) Area
    - Colstrip 1&2 STEP E Cell and Old Clearwell – lithium
- Units 3&4 Effluent Holding Pond (3&4 EHP) Area
    - 3&4 EHP A, B, C, D/E, G, J, J-1 Cells – lithium and cobalt.

A successful alternative source demonstration (ASD) was subsequently conducted for cobalt at 3&4 BAP (Hydrometrics, Inc., 2019d). The ASD was included in the 2019 Annual Groundwater Monitoring and Corrective Action Report for the Colstrip SES (Hydrometrics, Inc., 2020a).

Comprehensive demonstrations that all ACM requirements of §257.96 were met for the Colstrip SES were provided in three separate reports for CCR units at the Plant Site, 1&2 STEP area, and 3&4 EHP area (Hydrometrics, Inc. 2019a, 2019b, and 2019c). As detailed throughout the ACM reports, requirements were achieved largely by remedial evaluation activities conducted at the Colstrip SES under an Administrative Order on Consent (AOC) between the Montana Department of Environmental Quality (MDEQ) and Talen. The AOC was originally entered into by PPL MT, LLC, Talen's predecessor (PPLMT/MDEQ 2012).

1.2 PURPOSE

The purpose of this report is to provide a description of the progress of selecting and designing a remedy for each of the Colstrip SES CCR units with an SSL above the GWPS in accordance with §257.97(a). By rule, progress reports are required semi-annually until a final remedy is selected. A remedy has been selected in accordance with §257.97 for each of the CCR units on the Plant Site (1&2 B Pond, 1&2 BAP, and 3&4 BAP); and remedial activities were initiated at those CCR units within 90 days of remedy selection in accordance with §257.98. The Plant Site CCR unit remedies were identified in the Selection of Remedy Report (Hydrometrics, Inc. 2020b) and were certified by a qualified professional engineer, as required in §257.97(a). Therefore, progress made in selecting and designing the remedies associated with STEP and 3&4 EHP CCR units is the focus of this report.

1.3 RECORDKEEPING AND NOTIFICATION REQUIREMENTS

This report has been completed when it is placed in the Colstrip SES Facility Operating Record (FOR), as required by §257.105(h)(12). Per §257.106(9) and §257.107(h)(9), Colstrip SES operators will notify MDEQ and place this report on the public website within 30 days of posting it to the FOR.

1.4 ORGANIZATION

Progress related to design and selection of a remedy for CCR units found in the 1&2 STEP Area (STEP E Cell and STEP Old Clearwell) is discussed in Section 2.0. Progress related to design and selection of a remedy for CCR units found at the 3&4 EHP (A Cell, B Cell, C Cell, D/E Cell, G Cell, J Cell, and J-1 Cell) is discussed in Section 3.0. References to previous work conducted at the Colstrip SES or external sources are made throughout the discussion presented herein and are listed in Section 4.0.

2.0 1&2 STEP AREA CCR UNITS REMEDY SELECTION AND DESIGN PROGRESS

The process of selecting and designing corrective measures for the 1&2 STEP E Cell and Old Clearwell is ongoing and a final remedy has yet to be selected for those CCR units. However, based on the ACM conducted per §257.96 (Hydrometrics, Inc. 2019b) and the parallel Remedy Evaluation conducted under the AOC (Geosyntec 2019a, 2019c), a remedial alternative assembly (RAA) including fresh water flushing, increased groundwater capture, and source reduction from CCR unit capping/closure appears to be effective at mitigating constituents in groundwater downgradient of the CCR units. Institutional controls (IC), monitored natural attenuation (MNA), and a contingency permeable reactive barrier (PRB) are also included in the proposed RAA. Since the spring 2020 progress report was prepared (Hydrometrics, Inc. 2020c), facility operators submitted an Interim Report regarding aspects of a final remedy that would be implemented regardless of final source control options (i.e. freshwater flushing and groundwater capture) (Geosyntec 2020a). MDEQ provided conditional approval of the remedial components in the Interim Report (MDEQ 2020). Evaluation of additional source control alternatives is ongoing in 2020. A Revised Remedy Evaluation – Integrated Report (Geosyntec 2020b) was submitted to MDEQ in September 2020.

In accordance with §257.97(a), the final remedy will be selected as soon as feasible. However, the process of selecting the final remedy for STEP E Cell and Old Clearwell will closely follow the timeline of AOC remedial activities for the entire 1&2 STEP, which includes remedial actions for facilities other than the two CCR units. It is important to note that, as delineated in the 1&2 STEP ACM (Hydrometrics, Inc. 2019b), lithium SSLs are constrained to property owned by the Colstrip SES. Hydraulic control and effective capture of impacted groundwater in alluvium downgradient of the 1&2 STEP E Cell and Old Clearwell is maintained by a system of groundwater capture wells that will continue to operate during the remedy selection process and as part of the final remedy.

Upcoming work focused on selecting a remedy that will address lithium SSLs in alluvium

downgradient of STEP E Cell/Old Clearwell will include the following.

- Preparations for implementing the MDEQ-approved remedial components are expected to take place in fall 2020, with implementation expected to occur in 2021. A remedial design/remedial Action (RD/RA) Work Plan will be prepared upon MDEQ approval of the recently submitted Revised Remedy Evaluation.
- The Selection of Remedy Report for STEP E Cell and Old Clearwell will be prepared as soon as feasible, in accordance with §257.97, while allowing for subsequent remedy evaluation and design via the RD/RA Work Plan and a period of at least 30 days from a public meeting with interested and affected parties to discuss results of the ACM.

3.0 3&4 EHP CCR UNITS REMEDY SELECTION AND DESIGN PROGRESS

Based on the ACM conducted per §257.96 (Hydrometrics, Inc. 2019c) and the parallel Remedy Evaluation conducted under the AOC (Geosyntec 2018, revised 2019f), an RAA including fresh water injection, increased groundwater capture, and source reduction through pond closures has shown to be an effective approach to corrective action for constituents in groundwater at the 3&4 EHP. MDEQ conditionally approved the proposed remedy for the purposes of the AOC with the stipulation that several items related to additional data collection, evaluation, and ongoing monitoring must be completed (MDEQ 2020). The process of selecting the final remedy for the CCR units at the 3&4 EHP (A Cell, B Cell, C Cell, D/E Cell, G Cell, J Cell, and J-1 Cell) will closely follow the ongoing AOC evaluation.

Work completed since the spring 2020 semi-annual progress report (April 14, 2020) and upcoming work focused on selection and design of the remedy at CCR units of the 3&4 EHP includes the following.

- A 30% RD/RA Work Plan was prepared and submitted to MDEQ on May 15, 2020 (Geosyntec 2020c). The 30% RD/RA Work Plan included many of the detailed design elements of the approved remedy and provided methodologies to address MDEQ contingencies related to additional data collection.
- Additional vertical and horizontal well installation activities are ongoing at locations that were chosen as a result of the parallel AOC Remedy Evaluation and Assessment of Corrective Measures (§257.96) processes and identified in the RD/RA Work Plan.
- Field studies related to specific groundwater capture locations underlying the 3&4 EHP and soil sampling and analysis to evaluate potential secondary sources of constituents (including Appendix III and IV constituents) were initiated in summer 2020. Pending final analysis, results will be documented in technical reports to address MDEQ contingencies and help inform the final Selection of Remedy.
- Preparations for a freshwater flushing pilot test have been made and the test is scheduled to be conducted at two select flushing wells, as outlined in the RD/RA Work Plan, in October 2020.

- Data collected at wells installed in 2020, including data gathered during the 3&4 EHP capture study and freshwater flushing pilot test, will be used to update the three-dimensional numerical fate and transport model that is used as one of the primary tools to evaluate remedy effectiveness at the 3&4 EHP CCR units.
- The Selection of Remedy Report for 3&4 EHP CCR units will be prepared as soon as feasible, in accordance with §257.97(a), while allowing for subsequent remedy evaluation to address findings of activities conducted under the RD/RA Work Plan in 2020 and a period of at least 30 days from a public meeting with interested and affected parties to discuss results of the ACM. The public meeting to discuss the 3&4 EHP ACM is scheduled for October 14, 2020.

4.0 REFERENCES

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